

Claims

1 1. A lithium polymer secondary battery comprising a
2 positive electrode, a negative electrode, and a polymer electrolyte,
3 further containing ceramic not relating to charge and discharge
4 reaction of battery in at least one of positive electrode and
5 negative electrode.

*Sub
C2* 2. A lithium polymer secondary battery of claim 1,
1 wherein the ceramic is at least one type selected from the group
2 consisting of Al_2O_3 , SiO_2 , ZrO_2 , MgO , and Na_2O .

1 3. A lithium polymer secondary battery of claim 1,
2 wherein the ceramic is granular, and the particle size is 10 microns
3 or less.

1 4. A lithium polymer secondary battery of claim 1,
2 wherein the content of the ceramic is 0.01 to 20 parts by weight in
3 100 parts by weight of the active substance.

1 5. A lithium polymer secondary battery of claim 1,
2 wherein a polymer electrolyte is contained in at least one of the
3 positive electrode and negative electrode.

1 6. A lithium polymer secondary battery of claim 1,
2 wherein the polymer electrolyte is a gel polymer electrolyte
3 composed of polymer and an organic electrolyte solution dissolving
4 lithium salt.

1 7. A lithium polymer secondary battery of claim 1,
2 wherein ceramic is contained in the polymer electrolyte.

1 8. A lithium polymer secondary battery of claim 7,
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2 wherein the ceramic is at least one type selected from the group
3 consisting of Al_2O_3 , SiO_2 , ZrO_2 , MgO , and Na_2O .

1 9. A lithium polymer ~~secondary~~ battery of claim 7,
2 wherein the ceramic is granular, and the particle size is 10 microns
3 or less.

1 10. A lithium polymer secondary battery of claim 7,
2 wherein a polymer electrolyte is contained in at least one of the
3 positive electrode and negative electrode.

1 11. A lithium polymer secondary battery of claim 7,
2 wherein the polymer electrolyte is a gel polymer electrolyte
3 composed of polymer and an organic electrolyte solution dissolving
4 lithium salt.

1 12. A lithium polymer secondary battery comprising a
2 positive electrode and a negative electrode for occluding and
3 releasing lithium, and a polymer electrolyte, wherein the polymer
4 electrolyte is a gel polymer electrolyte containing Al_2O_3 particles
5 with particle size of 10 microns or less and 80 parts by weight or
6 less of nonaqueous electrolyte solution, and the negative electrode
7 is mixed with said gel polymer electrolyte so that Al_2O_3 particles
8 are contained.

1 13. A lithium ion secondary battery mainly comprising
2 a positive electrode using lithium transition metal compound oxide
3 as active substance, a negative electrode containing at least one
4 active substance selected from the group consisting of lithium
5 occluding and releasing carbon, metal oxide and polymer, and an
6 organic electrolyte solution, wherein the negative electrode
7 contains ceramic not relating to charge and discharge reaction of

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8 battery composed of at least one type selected from the group
9 consisting of Al_2O_3 , SiO_2 , ZrO_2 , MgO , and Na_2O , by 0.01 to 20
10 parts by weight in 100 parts by weight of active substance.

1 14. A lithium ion secondary battery of claim 13,
2 wherein the ceramic is granular with particle size of 10 microns or
3 less.

1 *Sub* 15. A lithium ion secondary battery of claim 13,
2 *at* wherein the ceramic is Al_2O_3 particles, contained by 0.01 to 20
3 parts by weight in 100 parts by weight of active substance.

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